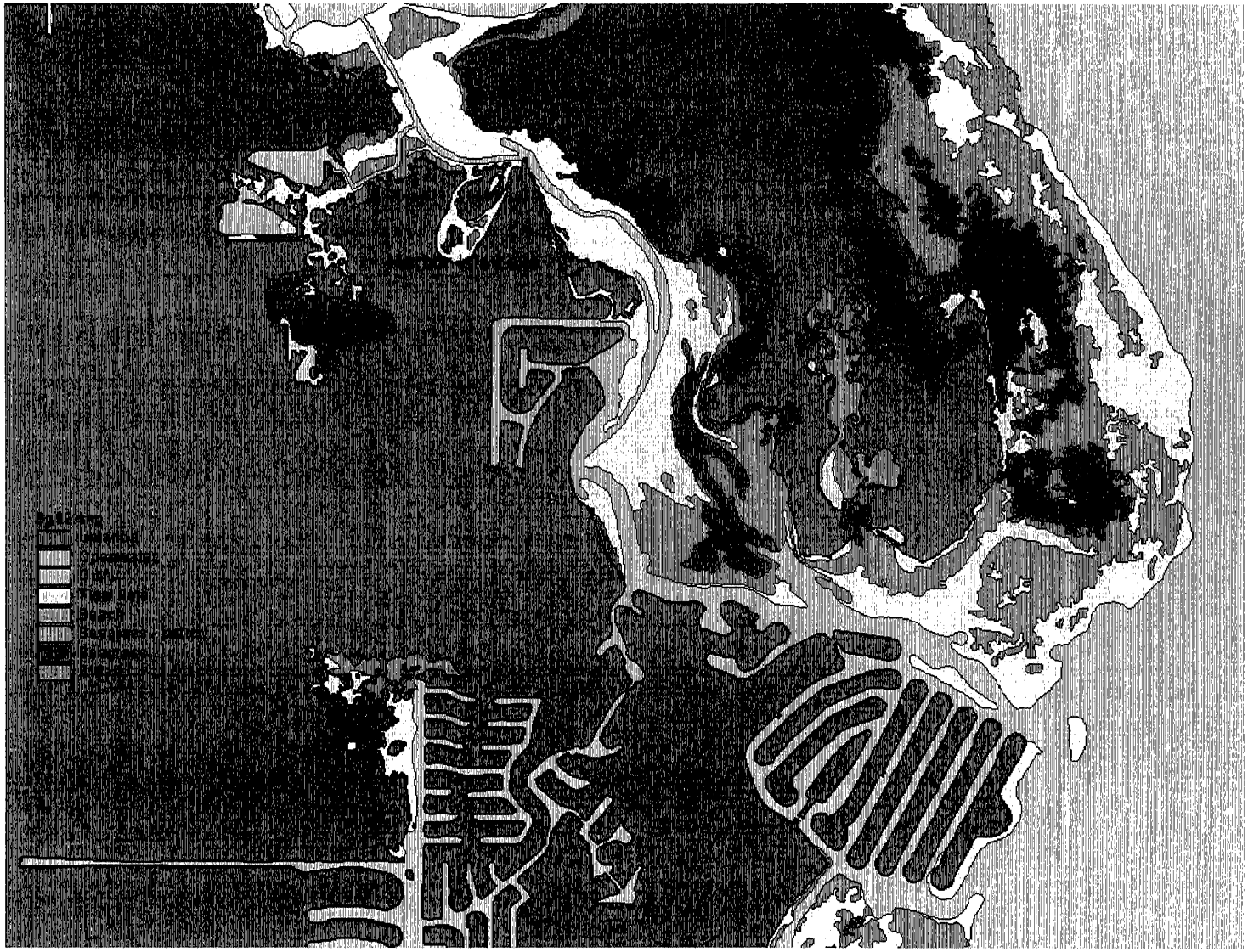

Figure 7, Seagrass Map Grande Bayou

e. Migratory Birds. Gulls, terns, sandpipers, plovers, stilts, skimmers and oystercatchers are known to inhabit the Bay. Other wading birds such as herons, egrets and ibises use the interior wetland areas. Disposal Site CMDA-3D provides nesting for Caspian terns, laughing gulls, American oystercatchers, black skimmers, and royal, least and sandwich terns (Paul, 1991). CMDA-2D is also inhabited by the same bird species, but there are more black skimmers and oystercatchers than on 3D. Nesting by these species is protected by the Migratory Bird Treaty Act. In addition, other National Wildlife Refuges, Pinellas, Passage Key and Egmont Key, also are known migratory nesting areas for numerous species of birds (EPA, 1994). The birds use the mangroves along Grande Bayou for nesting in various location. Waterfowl and wading birds use Harbor Isle Lake for loafing and browsing for food.

f. Mangrove Wetlands. The cove area adjacent to the Harbor Isles Lake is a mangrove wetland. Small boat navigation channels have been excavated through this area. This wetland area provides cover and spawning areas for fish and shrimp. The mature mangroves provide nesting for larger birds such as areas for birds such as the pelican. These wetlands cause improved water quality of the Bay from trapping sediments and nutrient uptake

3.3.3 Social.

a. Historic Properties. An archival and literature review, including a review of the current National Register of Historic Places listing and consultation with the Florida State Historic Preservation Officer (SHPO), was conducted to determine if significant cultural resources are present in the project area. No significant archeological sites or historic properties are recorded in the project area, and the area is judged to have little potential for containing significant cultural resources. In a letter dated September 4, 1991, the SHPO recommended that no further cultural resources investigations are necessary for the maintenance-dredging project.

b. Recreation. The dredging area is located in the Tampa Harbor navigation channel. Large recreational vessels use this channel to transit to and from various mooring facilities throughout the Bay and the Gulf of Mexico or other recreational parts of the Bay. The Upland DMMA's are used for bird watching, fishing and picnicking. The hole adjacent to MacDill AFB is used for fishing. Local residents use Harbor Isle Lake for fishing and bird watching. Grande Bayou also supports fishing and bird watching.

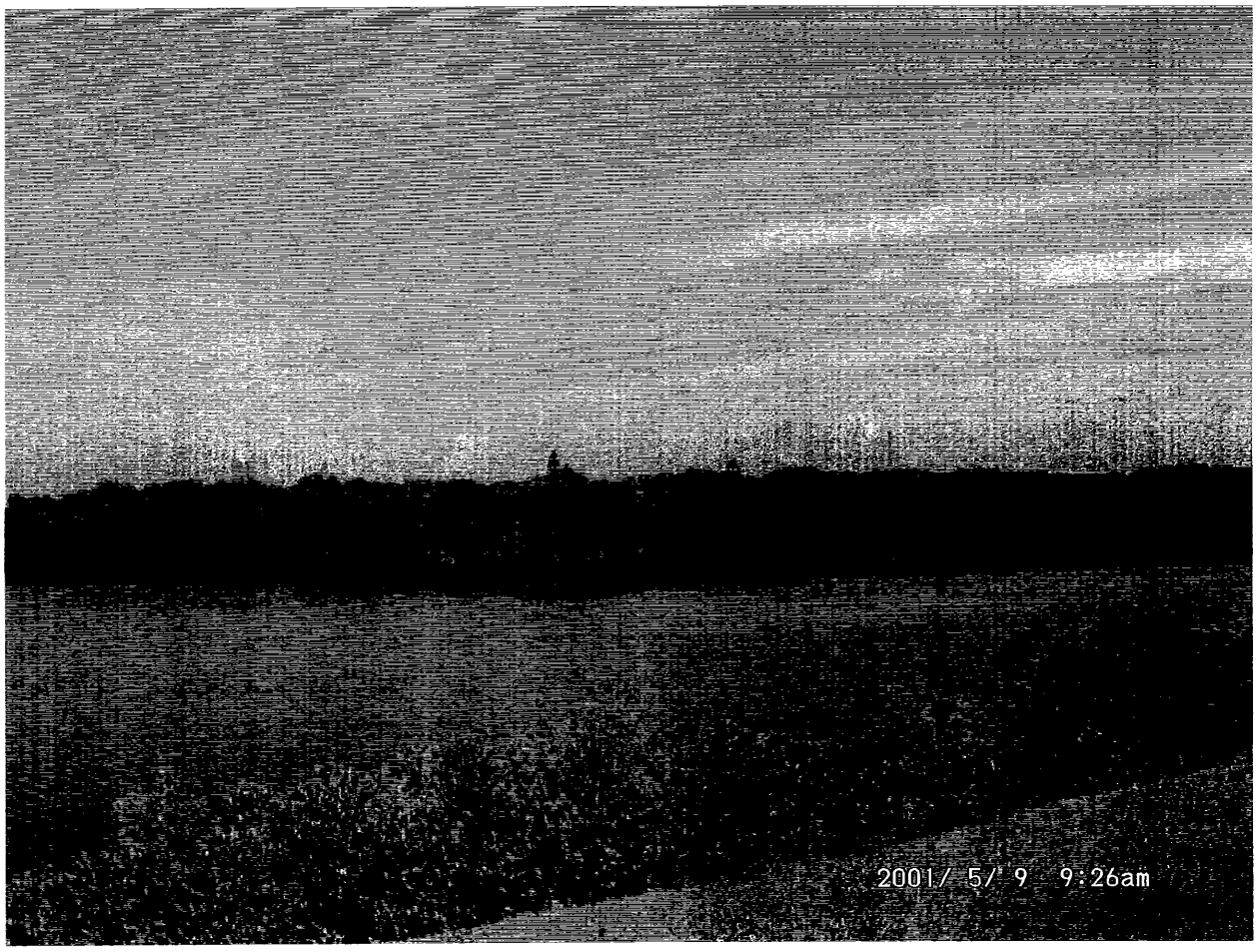

Figure 8, Slough off Grande Bayou

c. Aesthetics. The aesthetics of the dredging area is within a commercial navigation area, which see large ocean going cargo vessels, fishing vessels and large recreation craft transiting the area. The hole adjacent to MacDill AFB is located adjacent to the end of the runway and a mangrove vegetated shoreline. Compressed air concussion explosions are used to deter birds from the end of the runway during airplane take-off and landings. Harbor Isle Lake is surrounded by residential homes and is separated from Grande Bayou by a berm.

Figure 9, Harbor Isle Lake with berm in background

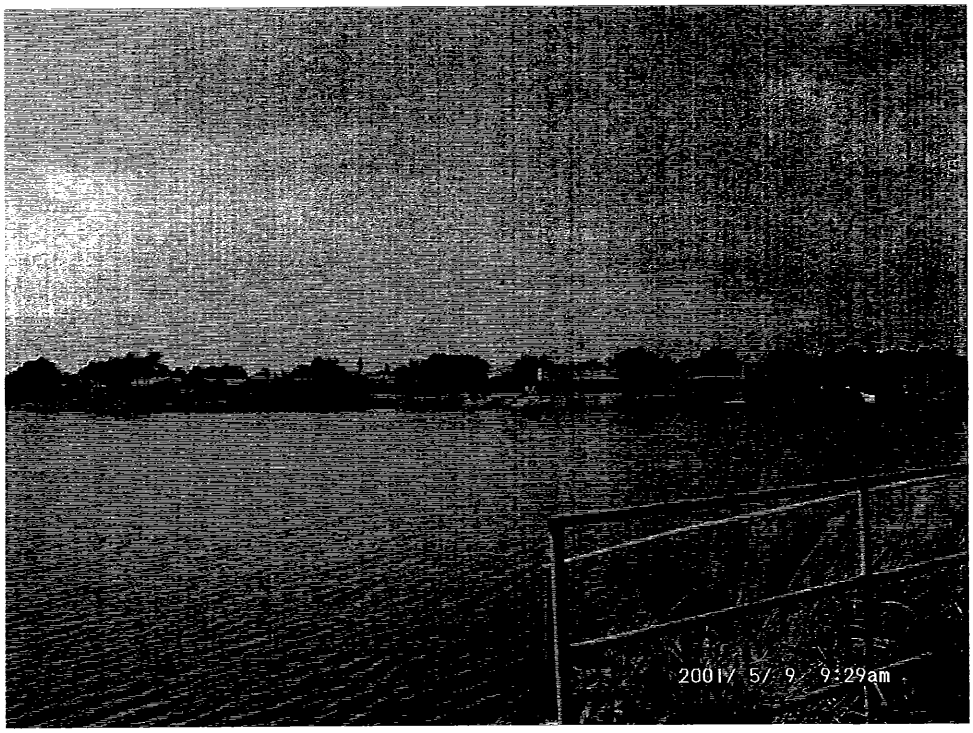

Figure 10, Harbor Isle Lake with residential homes in background

3.3.4 Economics.

a. Navigation. The navigation channel allows transportation of international and domestic cargo to and from the Port of Tampa. This provides long-term economic stimulus to the economy of Tampa metropolitan area and the generation of revenues from the sale of goods and services to public.

b. Economics. The activities that originally justified this project in Tampa Harbor were a tonnage moved of 268,206 in 1898. This is the first available information in the District Office records for Tampa Harbor. The first breakdown of cargo available for Tampa Harbor is in 1913. Principle items received were coal, sand, shell, cement, brick, Havana Tobacco and miscellaneous merchandise. Major items shipped were phosphate, lumber and miscellaneous freight. The total tonnage for 1913 was 2,222,873 tons. This represented increase of 825 percent in just 15 years from 1880. This phenomenal increase had been attributed to channel deepening in the harbor. Since the deepening of the entrance no maintenance dredging has been conducted and sedimentation forcing vessels to light load in the upper channel. This required that the vessels either add additional freight at another port or load from a lighter (a barge) further down the harbor. The data used to justify the Federal project in Tampa was taken from 1971. Tampa Harbor was the 8th largest port in the United States, handling 36,000,000 tons of commerce almost equally divided between inbound and outbound. The major commodities requiring deeper channels are phosphates, petroleum products, and sulfur. Phosphate products were the major beneficiaries of deepening the channels. There were three major phosphate terminals at Tampa where vessels could not be fully loaded because of restrictive channel depths. In that year, there were some 230 outbound vessels of which about 160 could have taken on more cargo if not restricted by draft. Looking at economic information for Tampa Harbor over the last five years, tonnage and growth rates appear to have stayed reasonably steady. The numbers have varied but while being down one year they recovered in the next. In 1994 Tampa handled about 49 million tons of cargo and commercial passenger transport increased about 50 percent.

4 ENVIRONMENTAL CONSEQUENCES.

4.1 INTRODUCTION.

This section describes the probable consequences of implementing each alternative on selected environmental resources. These resources are directly linked to the relevant issues listed in Section 1.4 that have driven and focus the environmental analysis. The following includes anticipated changes to the existing environment including direct and indirect impacts, irreversible and irretrievable commitment of resources, unavoidable effects and cumulative impacts.

4.1.1 Cumulative Impacts.

Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7).

4.1.2 Irreversible and Irretrievable Commitment of Resources.

a. Irreversible. An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. One example of an irreversible commitment might be the mining of a mineral resource.

b. Irretrievable. An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose; opportunities to use or enjoy the resource as they presently exist are lost for a period of time. An example of an irretrievable loss might be where a type of vegetation is lost due to road construction.

4.2 NO ACTION ALTERNATIVE

4.2.1 Physical.

a. Water quality. There would be a localized increase in turbidity at the dredging site. This impact would meet State water quality standards. The effluent from the upland DMMA's would be relatively clean and meet NPDES standards for dredged material management..

4.2.2 Biological

a. Benthos. There would be a minor impact on benthic organisms within the dredging area. These organisms would be eliminated and moved to an upland area.

b. Manatees. The auxiliary vessels associated with the dredging operation could impact manatees. In order to reduce this impact, the standard state and Federal manatee protection conditions would be implemented. Included in these conditions are an education requirement, monitoring and avoidance of manatees. This avoidance includes a requirement to shutdown equipment should individuals come close to the equipment.

c. Fisheries. There would be no impact on fisheries in the Bay during dredging or placement.

d. Seagrass. There would be no impacts on seagrass during dredging.

e. Migratory Birds. There could be an adverse impact on migratory bird nesting in the DMMA's. This impact would be mitigated by the implementation of the Districts migratory bird protection plan during construction. This plan includes the voluntary

avoidance of migratory bird nesting season (1 April through 30 August). If avoidance cannot be accomplished then, a monitor is employed to identify and segregate nesting areas from construction activities.

4.2.3 Social.

a. Historic Properties. There would be no affect on historic properties included in or eligible for inclusion in the National Register of Historic Places.

b. Recreation. There would be a minor disruption of fishing and bird watching during placement in the DMMA's.

c. Aesthetics. There would be relatively no impacts on aesthetics from this alternative because the work is conducted in areas typically used for that purpose.

4.2.4 Economic.

a. Navigation. There would be a long-term major benefit from the continued maintenance on the navigable capacity. There would be a short-term disruption to commercial navigation from the presence and operation of dredging equipment.

b. Economics. There would be a medium, short-term benefit to the local economy from the sale of goods and services in support of the construction effort. There would be a long-term benefit on the economics of the area from the maintenance of cargo handling capacity of the channel.

4.2.5 Cumulative effects.

If this action was considered in conjunction with other similar projects and similar No Actions, there would be no cumulative adverse impact.

4.2.6 Unavoidable effects.

There would be a minor adverse increase in turbidity at the dredging site and disruption of commerce in the navigation channel from the presence and operation of dredging equipment.

4.2.7 Irreversible and Irretrievable Resource Commitments.

There would be no irreversible or irretrievable commitment of resources from the selection of this alternative.

4.3 DREDGING AND MACDILL HOLE PLACEMENT

4.3.1 Physical.

a. Water quality. There would be a minor short-term increase in turbidity at the dredging site and the near-shore placement area. There would also be a long-term benefit to

water quality of this area by providing better circulation and eliminating a hole where low levels of dissolved oxygen accumulate.

4.3.2 Biological.

Dredging would result in the loss of benthic organisms at the sites designated for maintenance. These communities will reestablish themselves upon completion of the work. There will be a temporary disruption of normal activity of marine life in the vicinities of the dredging and disposal areas return water. Most animal life will relocate to surrounding areas during dredging operations. The benthic fauna would be smothered by the placement of dredged material at the disposal site. Fish would avoid the turbidity plumes to the extent possible. Some species of fish would be attracted to the suspension of benthic organisms in the water column contained in the material.

a. Benthos. The benthic organisms at the dredging site would be eliminated. This area would be rapidly re-colonized by the organisms that can be moved by tidal flows from adjacent areas. Crustaceans and clams would take longer to re-enter the area. The benthic organisms would be covered and smothered by the placement of material in the littoral zone. The organisms in the dredged material would help re-colonize the littoral area.

b. Manatees. The auxiliary vessels associated with the dredging operation could impact manatees. In order to reduce this impact, the standard state and Federal manatee protection conditions would be implemented. Included in these conditions are an education requirement, monitoring and avoidance of manatees. This avoidance includes a requirement to shutdown equipment should individuals come close to the equipment.

c. Fisheries. There would be an incremental loss of fishing habitat and cold water refugia. Over time, the hole would be filled, the fish would migrate to other edges and utilized the tidal trough as cold water refugia. There would also be the long-term potential for seagrasses to colonize this area, creating habitat for juvenile species of fish.

d. Seagrass. Dredging would not impact seagrass beds. Turbidity at the placement site could impact nearby seagrass beds. This impact would be mitigated by the use of flocculent or turbidity screens to isolate the turbidity from the plants.

e. Migratory Birds. There would be no impacts on migratory birds from this alternative.

4.3.3 Social.

a. Historic Properties. As discussed in section 3.3.3.a. of this document, no significant resources were identified during the archival research. Significant historic properties are not known to exist in the disposal area. This alternative would have no effect on resources included in or eligible for inclusion in the National Register of Historic Places.

b. Recreation. There would be a short-term minor impact on recreational navigation from the presence and operation of the dredging equipment in the navigation channel. There would also be a short-term impact on recreational fishing at the hole from the presence and operation of the dredging equipment.

c. Aesthetics. There would be a short-term degradation of the aesthetics of the navigation channel and the hole from the view from the presence and the noise from the operation of heavy equipment and a disruption of the seascape.

4.3.4 Economic.

a. Navigation. There would be a long-term major benefit from the continued maintenance on the navigable capacity. There would be a short-term disruption to commercial navigation from the presence and operation of dredging equipment.

b. Economics. There would be a medium, short-term benefit to the local economy from the sale of goods and services in support of the construction effort. There would be a long-term benefit on the economics of the area from the maintenance of cargo handling capacity of the channel.

4.3.5 Cumulative effects.

If this action was considered in conjunction with other similar projects and similar No Actions, there would be a substantial adverse impact on cold water refugia in the Bay.

4.3.6 Unavoidable effects.

There would be localized turbidity at both the dredging site and the placement area and disruption of commercial navigation in the channel.

4.3.7 Irreversible and Irretrievable Resource Commitments.

There would be no irreversible or irretrievable commitment of resources from the selection of this alternative.

4.4 DREDGING AND HARBOR ISLE LAKE PLACEMENT.

4.4.1 Physical.

a. Water Quality. Dredging operations will result in some temporary changes in water quality. Turbidities in the area of dredging will be elevated above normal. Visible plumes at the water surface are expected in the immediate vicinity of the dredging operation. Elevated turbidity levels are expected to dissipate rapidly, returning to background levels in a short period of time. The disposal area has been designed and sized to allow for settling of sediments prior to being discharged into the Bay. Temporary minor elevations in turbidity levels will be experienced from the return water from the disposal site. Maintenance dredging of the project would result in a temporary increase in turbidity in

the immediate project area. However, no long term adverse impact on water quality will result from this project. Increased depth and clearance in the shipping channel as a result of shoal removal will reduce turbidity due to a reduction in sediments being re-suspended and retained in the water column by prop wash of passing ships. The reduced water depths in the lake would provide a long-term benefit to water quality by allowing sunlight penetration to the bottom, reducing stratification and increasing the potential for the growth of oxygen replenishing vegetation.

b. Historic properties. Even though significant submerged historic properties are located in Tampa Harbor, there would be no effect on submerged properties should the dredging only occur to previously dredged depths. There are no properties located at the disposal site. If during maintenance activities the contractor observes resources that might have historical or archeological value, and these resources may be affected by further work activities, these resources shall be reported to the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in the destruction of these resources and shall prevent his employees from trespassing on, removing, or otherwise damaging such resources.

c. Noise. There would be relatively no impact from dredging within the harbor due to the background levels within the harbor area. There would be increases in noise levels at the disposal site from the presence and operation of the discharge equipment. This impact would be mitigated by the implementation of local noise ordinances.

4.4.2 Biological.

Dredging would result in the loss of benthic organisms at the sites designated for maintenance. These communities will reestablish themselves upon completion of the work. Temporary disruption of normal activity of marine life in the vicinities of the dredging and disposal areas returns water is likely. Most animal life will relocate to surrounding areas during dredging operations. The benthic fauna would be smothered by the placement of dredged material at the disposal site. Fish would avoid the turbidity plumes to the extent possible. Some species of fish would be attracted to the suspension of benthic organisms in the water column contained in the material. The increased BOD would extirpate most of the fish. The placement of material in Harbor Isles Lake would increase the water quality and allow for the development of a viable fishery to develop in the long-term.

a. Manatees. Since manatees are likely to be found in the vicinity of the Tampa harbor channel, they are likely to be affected. To mitigate for this impact, the standard State and federal manatee protection conditions would be implemented during construction (Appendix II).

b. Seagrasses. There are no seagrasses in the vicinity of the dredging or disposal area. During the offloading of materials, pipelines would be placed along the Grande Bayou channel in the vicinity of seagrass beds. Anchoring could adversely affect these beds.

Therefore, conditions would be placed on the anchoring of the pipeline to avoid these areas. Therefore, there would be no impact on this resource.

c. Sea turtles. Sea turtles are known to inhabit the areas around the mouth of the Bay as they migrate to nesting and forage areas. If a hopper dredge is used for the work, there could be an impact on sea turtles in the area. In order to minimize this impact special conditions would be implemented during dredging to avoid taking sea turtles. These conditions include the use of the new prototype draghead with the turtle excluder device and monitoring of the equipment to insure proper design and use.

d. Migratory Birds. Nesting along Grande Bayou could be affected by pipeline placement during the 1 April to 31 August timeframe. This impact would be mitigated by the implementation of the Migratory Bird Protection Plan which includes monitoring as was as avoidance of nesting areas.

4.4.3 Social.

a. Aesthetics. Air pollution, water turbidity, and noise pollution increases can be expected during project construction. Temporary construction impacts will not adversely affect the existing aesthetics found in the harbor area. There would be short-term adverse aesthetic impacts from the presence and operation of the disposal equipment in the Grande Bayou and Harbor Isles Lake area. Visual impacts would include the equipment and the turbidity plume generated within the lake. This would also include the offloading barge anchored in the Grande Bayou channel disrupting the view of the area.

b. Recreation. No recreational activities would be affected by the dredging or disposal operations. The increased navigable capacity of this harbor would provide for major recreational benefits derived from cruise ships using the port. There would be a minor short-term disruption to the recreational boat traffic and fishing in the Grande Bayou area from the presence and operation of the dredged material transport and disposal operations.

4.4.4 Economic

a. Navigation. The proposed work will result in some temporary disruption of normal vessel traffic in the channel. The completion of work will have a favorable impact on the port with resulting beneficial effects to the local and regional economies. There would be a minor short-term disruption to the recreational boat traffic in the Grande Bayou area from the presence and operation of the dredged material transport and disposal operations.

b. Economics. There would be a minor short-term stimulus to the local economy from the sale of goods and services in support of the dredging. There would be a long-term minor impact on the regional economy from the increased safe passage of all types of commercial vessels into this port area.

4.4.5 Cumulative effects.

There would be no cumulative effects from the maintenance dredging and disposal operations.

4.4.6 Unavoidable effects.

There would be turbidity generated at both the dredging and disposal sites. The excavation of the material would eliminate benthic organisms within the dredging cut and cover the benthic organisms at the disposal site. Another unavoidable impact would be the short-term disruption to recreational navigation and fishing on Grande Bayou from the presence and operation of the dredged material transport and disposal operations.

4.4.7 Irreversible and Irretrievable Resource Commitments.

A long-term commitment has been made concerning the designation of the upland disposal area, and the use and maintenance of the navigation channel. Basically, these commitments of the bottom resources are irreversible and irretrievable.

5 LIST OF PREPARERS.

The following professionals prepared the Environmental Assessment.

NAME	DISCIPLINE	EXPERIENCE	ROLE IN PREPARING EIS
William J. Fonferek	Biologist	25 years environmental impacts assessment	NEPA Coordinator, Biological Impact Assessment, Endangered Species Consultation
Tim Murphy	Civil Engineer	8 years experience	Project Manager
Paul Stevenson	Landscape Architect	12 years experience recreation design, construction and development	Recreation Resources Analysis and Mitigation Development
Tommy Birchett	Archeologist	20 years historic property management and assessment	Historic Property Analysis and Assessment
Glen Schuster	Environmental Engineer	21 years	HTRW and Water Quality Investigations and Impact Assessment

6 CONSULTATION WITH OTHERS - PUBLIC INVOLVEMENT PROCESS.

6.1 A special meeting of the Tampa Bay Regional Planning Council, Agency on Bay Management, Natural Resources /Environmental Impact Review Committee met on Friday, August 7th, 1998, was held to discuss the project. The Committee voted to support the project.

6.2. A meeting was held between the Corps and the Florida Department of Environmental Protection concerning the restoration of this area on March 30 1996.

6.3. Public notice (PN-TH-222) dated July 17, 1998 was issued for this project. The following comments were received:

6.4. The Agency on Bay Management responded by letter dated 29 October 1998, forwarding data on borrow areas fisheries and recommended additional studies be conducted to determine the location and number of such structures in the Bay.

Response: Additional studies have been initiated as part of the Dredged Material Management Plan for the Bay.

6.5. The National Marine Fisheries Service responded by e-mail dated 13 August 1998, 4:17 p.m. stating that they anticipate no adverse effect on marine and anadromous fishery resources.

6.6. A new public notice (PN-CO-HIL-254) advertising the connection of placement of dredged material in Harbor Isle Lakes from St Petersburg Harbor to the dredging of Tampa Harbor Cut G area was published on June 8, 2001.

6.7. On 2 July 2001, Ms Karen G. Pastula and Mr Charles J. Dubauskas responded in joint letter providing and requesting information:

- The City of St Petersburg stated in a report that the fish kill was a result of a thermal inversion and refuted our claim that it was due to lack of oxygen.

RESPONSE: Thermal stratification within the lake causes oxygen-poor water to settle at the bottom. If an inversion happens, this oxygen-depleted water is mixed with normal surface water and ends up on the surface killing the fish that live in the photic zone. If the inversion is partially caused by cooler surface water runoff, this runoff contains nutrients from lawn fertilizers which also cases algae and plant growth further depleting the oxygen.

- Ms Pastula and Mr Dubauskas also commented that the public notice proposed using and unspecified source of material to be placed in the lake was ill advised. They also stated they

had not seen any data or studies that showed how this project would accomplish the environmental goals of the project.

RESPONSE: The project was suggested by the Florida Department of Environmental Protection who accomplished a similar project at Riviera Bay. Scientists from various agencies as well as the Tampa Baywatch have also recommended this project. It has been previously approved by the Agency on Bay Management, the citizen advisory group for the Tampa Bay Regional Planning Council. In addition a Water Quality Certificate has been issued for the placement of material in the lake from the St Petersburg Harbor project. We believe that what we are planning to do has been well documented and reviewed to ensure success.

- They raised several issues including unwanted cattail growth, increased concentration of pollutants, and visual appearance of the lake.

RESPONSE: Based on the design suggested, the bottom elevation will be raised to 6 feet below the surface. This depth will not promote cattail growth. The sediments in the Bay as well as the lake come from surface water runoff. The fine sediments hold the metals that are considered pollutants. The sediments and pollutants in both places are similar. However, we conduct tests of the dredged material to determine if it meets water quality standards for placement at this site. These tests are coordinated with and approved by the Florida Department of Environmental Protection to ensure compliance with State statute. From the surface there will be no difference in the appearance of the lake.

- They stated that the local paper has reported how large amounts of sludge and sediments have reduced depths, created excessive vegetation and years of pollution in other lakes and that many other projects desire to remove sediments and deepen them. This appears to be contradictory to this proposal.

RESPONSE: The reduction in depth refers to sedimentation to a level where no water circulation can occur. It also is shallow enough to allow cattails and other vegetation to proliferate. The pollution entering most of these lakes and waterways is from nutrients from agricultural runoff, lawn fertilizers and pesticides, and septic tanks. This promotes the growth of unwanted vegetation including algae. When this growth occurs it reduces the amount of oxygen in the system. The sediments from the navigation channels very based on the location and is a mixture of sand and silt. We have historical data on the composition of the dredged material from various parts of the Harbor. The proposal does not plan to place polluted materials in the lake to a depth to promote cattail or other vegetative growth or reduce the aesthetic appeal of the landscape. Filling the lake will eliminate the stratification within the water column and increase the mixing which will overall improve the water quality.

6.8. Mr. Michael J Conners, City of St Petersburg responded to the public noticed by letter dated 27 June 2001, stating that the Harbor Isle Lake Homeowners Association voted to restrict the filling of the lake to a depth of 11-12 feet and that the sediments would consist of 2/3^{rds} sand and 1/3rd silty sand. This position was endorsed and accepted by the City.

6.9. The Department of Community Affairs representing the Florida State Clearinghouse has reviewed the public notice and has determined that the project is consistent with Florida Coastal Zone management Program by letter dated 4 June 2001.

7 COMMITMENTS.

a. The standard State and Federal manatee protection conditions would be implemented.

b. If a hopper dredge is used, a sea turtle monitor will be employed to check to see that no mortalities happen. The draghead will be outfitted with a deflector and will be operated in accordance with District policy. If 3 turtle mortalities occur, the operation will cease until a risk assessment can be conducted to determine the risk for future mortalities. The South Atlantic Division Commander will authorize continuation of dredging.

c. The District Migratory Bird Plan will be implemented during the 1 April through 31 August timeframe. This includes daily monitoring as well as avoidance of nesting areas.

d. Seagrass beds will be avoided.

8 INDEX

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